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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/701,205	11/27/2000	Michael Kalchman	MC010PI	7948
210	7590	05/05/2004	EXAMINER	
MERCK AND CO INC P O BOX 2000 RAHWAY, NJ 070650907			LU, FRANK WEI MIN	
			ART UNIT	PAPER NUMBER
			1634	

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/701,205

Applicant(s)

KALCHMAN ET AL.

Examiner

Frank W Lu

Art Unit

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7, 13, 14, 16, 17 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7, 13, 14, 16, 17 and 20-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 November 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's response to the office action filed on September 18, 2003, applicant's response to the office communication filed on January 23, 2004, and applicant's response to Notice of Non-Compliant amendment filed on February 23, 2004 have been entered. The claims pending in this application are claims 7, 13, 14, 16, 17, and 20-25. Rejection and/or objection not reiterated from the previous office action are hereby withdrawn in view of the amendments. The following rejections are based on amendments.

Drawings

2. The examiner notes that applicant does not response to Notice of Draftsperson's Patent Drawing Review (PTO-948) mailed on June 3, 2003.

Specification

3. The substitute specification filed September 18 and January 23, 2004 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) since applicant does not submit a substitute specification in clean form without markings as to amended material.

4. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required. The first page of WO 99/60986 in this instant application is not considered as a separate abstract sheet. Note that applicant does not address this issue (see previous office action mailed on June 18, 2003).

5. The use of the trademark "TRITON" has been noted in this application. For example, see page 16, lines 22 and 23. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks. Note that applicant does not address this issue (see previous office action mailed on June 18, 2003).

6. Following objections made in the office action mailed on June 18, 2003 are maintained since the substitute specification filed September 18, 2003 and January 23, 2004 has not been entered (see above)

The specification contains web sites. For example, in page 24, lines 13 of the specification, there is <http://dot.imgen.bcm.tmc.edu:9331/seq.search/gene.search.html>. Thus the disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

The disclosure is objected to because of the following informality: (1) "a longer region of cDNA totaling 4795 bases" in lines 12 and 13 in page 5 should be "a longer region of cDNA totaling 4796 bases" since the length of HIP1 cDNA is 4796 bases (see SEQ ID NO: 3); and (2) in several places of the specification, applicant uses "C" to replace "⁰C". For example, see page 15, last line.

Appropriate correction is required.

Claim Objections

7. Claim 7 is objected to because of the following informality: “encode” in line 3 should be “encodes”.

8. Claims 13 and 14 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. According to claim 7, the HIP apoptosis modulating protein is a HD-interacting polypeptide wherein said polypeptide consists of a sequence of amino acids selected from the group consisting of SEQ ID Nos: 2, 4, 5, and 7. Since the phrases “the HIP apoptosis modulating protein has a sequence as set forth in SEQ ID NO: 4” recited in claim 13 and “the HIP apoptosis modulating protein has a sequence as set forth in SEQ ID NO: 5” recited in claim 14 are read as “the HIP apoptosis modulating protein comprises a sequence as set forth in SEQ ID NO: 4” and “the HIP apoptosis modulating protein comprises a sequence as set forth in SEQ ID NO: 5”, it appears that a sequence of the HIP apoptosis modulating protein (ie., comprising SEQ ID NO: 4 or 5) recited in claim 13 or 14 is equal or longer than a sequence of the HIP apoptosis modulating protein (ie., consisting of SEQ ID NO: 4 or 5) recited in claim 7. Therefore, claims 13 and 14 do not further limit claim 7. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

9. Claim 17 is objected to because of the following informality: delete “that” between “claim 16” and “is”.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 7, 14, 21, and 23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for encoding a HD-interacting polypeptide consisting of SEQ ID NO: 4 using an expression vector comprising an isolated nucleic acid molecule consisting of SEQ ID NO: 3, does not reasonably provide enablement for encoding a HD-interacting polypeptide consisting of a sequence of amino acids selected from the group consisting of SEQ ID Nos: 2, 5, and 7 using an expression vector comprising an isolated nucleic acid molecule consisting of SEQ ID NO: 3. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

Note that, since an expression vector comprising an isolated nucleic acid molecule consisting of SEQ ID NO: 3 can encode a HD-interacting polypeptide consisting of SEQ ID NO: 4, claims 13, 20, 22, 24, and 25 should not be included in the rejection below. Since a host cell comprising the expression vector of claim 7 comprising an isolated nucleic acid molecule consisting of a sequence of nucleotides as set forth in SEQ ID NO:3, claims 16 and 17 should not be included in the rejection below.

Factors to be considered in determining whether a disclosure meets the enablement requirement of 35 USC 112, first paragraph, have been described by the court in *In re Wands*, 8 USPQ2d 1400 (CA FC 1988). *Wands* states at page 1404,

“Factors to be considered in determining whether a disclosure would require undue experimentation have been summarized by the board in *Ex parte Forman*. They include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the

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prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.”

The nature of the invention

The claim 7 is drawn to an expression vector comprising an isolated nucleic acid molecule consisting of SEQ ID NO: 3 that can encode a polypeptide selected from the group consisting of SEQ ID Nos: 2, 4, 5, and 7. Claim 14 indicates that SEQ ID NO: 3 can encode SEQ ID NO: 5. Claim 21 indicates that an isolated nucleic acid molecule consisting of SEQ ID NO: 3 that can encode a polypeptide consisting of SEQ ID NO: 5. Claim 23 is directed to a host cell transfected or transformed with an expression vector comprising the isolated nucleic acid molecule of claim 21. The invention is in a class of invention which the CAFC has characterized as “the unpredictable arts such as chemistry and biology.” *Mycogen Plant Sci., Inc. v. Monsanto Co.*, 243 F.3d 1316, 1330 (Fed. Cir. 2001) (see below).

The Breadth of The Claims

Claim 7 encompasses an expression vector comprising an isolated nucleic acid molecule consisting of a sequence of nucleotides as set forth in SEQ ID NO: 3, which encodes an HD-interacting polypeptide, wherein HD-interacting polypeptide is a HIP-apoptosis modulating protein and wherein said polypeptide consists of a sequence of amino acids selected from the group consisting of SEQ ID NO: 2, 4, 5, and 7. Claim 14 encompasses an expression vector comprising an isolated nucleic acid molecule consisting of a sequence of nucleotides as set forth in SEQ ID NO: 3, which encodes a sequence comprising SEQ ID NO: 5. Claim 21 encompasses an isolated nucleic acid molecule consisting of SEQ ID NO: 3 that can encode a polypeptide

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consisting of SEQ ID NO:5. Claim 23 encompasses a host cell transfected or transformed with an expression vector comprising the isolated nucleic acid molecule of claim 21.

Working Examples

The specification provides different working examples (see pages 11-31).

The Amount of Direction or Guidance Provided and The State of The Prior Art

The specification provides guidance to show that an isolated nucleic acid molecule consisting of SEQ ID NO: 3 can encode a HD-interacting polypeptide consisting of SEQ ID NO: 4 (see page 5, lines 3-14). However, there is no direction or guidance in the specification to show an isolated nucleic acid molecule consisting of SEQ ID NO: 3 can encode a HD-interacting polypeptide selected from the group consisting of SEQ ID NOs: 2, 5, and 7. In fact, sequence comparison among SEQ ID Nos: 2, 4, and 7 indicates that SEQ ID NO: 2 or SEQ ID NO: 7 is not part of SEQ ID NO: 4. Thus, an isolated nucleic acid molecule consisting of SEQ ID NO: 3 cannot encode a HD-interacting polypeptide selected from the group consisting of SEQ ID NOs: 2 and 7. Furthermore, although SEQ ID NO: 5 is longer than SEQ ID NO: 4 and has SEQ ID NO: 4 (see page 5, lines 3-14 and SEQ ID Nos: 4 and 5), the specification does not teach that an isolated nucleic acid molecule consisting of SEQ ID NO: 3 can encode SEQ ID NO: 5. Applicant does not provide an evidence to show that an isolated nucleic acid molecule consisting of SEQ ID NO: 3 can encode SEQ ID NO: 5 either.

Level of Skill in The Art, The Unpredictability of The Art, and The Quantity of Experimentation Necessary

While the relative skill in the art is very high (the Ph.D. degree with laboratory experience), there is no predictability whether an isolated nucleic acid molecule consisting of

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SEQ ID NO: 3 can encode a HD-interacting polypeptide selected from the group consisting of SEQ ID NOs: 2, 5, and 7. As mentioned previously, since the specification does not provide any guidance to show that an isolated nucleic acid molecule consisting of SEQ ID NO: 3 can encode a HD-interacting polypeptide selected from the group consisting of SEQ ID NOs: 2, 5, and 7, there will be a lot of unpredictable factors when the skilled artisan, based on claims 7, 14, and 21 of this instant application and the specification, uses an isolated nucleic acid molecule consisting of SEQ ID NO: 3 to encode a HD-interacting polypeptide selected from the group consisting of SEQ ID NOs: 2, 5, and 7. With the predictability in the relevant art being low, the amount of experimentation needed to be exerted by the public in practicing the full scope of the invention would not fall within the limits of routine experimentation. Such efforts constitute undue experimentation. The situation at hand is analogous to that in *Genentech v. Novo Nordisk A/S* 42 USPQ2d 1001 (see above). As set forth in the decision of the Court:

“ ‘[T]o be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation.’ *In re Wright* 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993); *see also Amgen Inc. v. Chugai Pharms. Co.*, 927 F. 2d 1200, 1212, 18 USPQ2d 1016, 1026 (Fed Cir. 1991); *In re Fisher*, 427 F. 2d 833, 166 USPQ 18, 24 (CCPA 1970) (‘[T]he scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art.’). ”

“Patent protection is granted in return for an enabling disclosure of an invention, not for vague intimations of general ideas that may or may not be workable. *See Brenner v. Manson*, 383 U.S. 519, 536, 148 USPQ 689, 696 (1966) (starting, in context of the utility requirement, that ‘a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion.’) Tossing out the mere germ of an idea does not constitute enabling disclosure. While every aspect of a generic claim certainly need not have been carried out by an inventor, or exemplified in the specification, reasonable detail must be provided in order to enable members of the public to understand and carry out the invention.

“It is true . . . that a specification need not disclose what is well known in the art. *See, e.g., Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1385, 231 USPQ 81, 94 (Fed. Cir. 1986). However, that general, oft-repeated statement is merely a rule of supplementation, not a substitute for a basic enabling disclosure. It means that the omission of minor details does not cause a specification to fail to meet the enablement requirement. However, when there is no disclosure of any specific starting material or any of the conditions under which a process can be carried out, undue experimentation is required; there is a failure to meet the enablement

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requirement that cannot be rectified by asserting that all the disclosure related to the process is within the skill of the art. It is the specification, not the knowledge of one skill in the art, that must supply the novel aspects of an invention in order to constitute adequate enablement. This specification provides only a starting point, a direction for further research.

Accordingly, it is concluded that undue experimentation is required to make the invention as it is claimed. The undue experimentation at least includes to test whether an isolated nucleic acid molecule consisting of SEQ ID NO: 3 can encode a HD-interacting polypeptide selected from the group consisting of SEQ ID NOs: 2, 5, and 7.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 7, 13, 16, 17, 20, 22, 24, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Kalchman *et al.*, (WO 97/18825, published on May 29, 1997).

The inventions are directed to an expression vector, a host cell, and an isolated nucleic acid molecule. Claim 7 requires that an expression vector for expression of a gene in a mammalian host comprising an isolated nucleic acid molecule consisting of a sequence of nucleotides as set forth in SEQ ID NO: 3, which encodes a HD-interacting polypeptide wherein the HD-interacting polypeptide is a HD apoptosis modulating protein and wherein said polypeptide consists of a sequence of amino acids selected from the group consisting of SEQ ID Nos. 2, 4, 5, and 7. Claim 13 requires that the HIP-apoptosis modulating protein has a sequence

as set forth in SEQ ID No. 4. Claim 16 requires that a host cell comprising the expression vector of claim 7. Claim 17 further limits claim 16 and requires that the host cell is a mammalian cell. Claim 20 requires an isolated nucleic acid molecule consisting of the nucleotide sequence as set forth SEQ ID NO:3. SEQ ID NOs:3 and 4 are HIP1 cDNA with 4796 nucleotides and its corresponding protein sequence with 914 amino acids (HIP1) respectively (see specification, lines 3-14 in page 5 and SEQ ID Nos: 3 and 4).

Kalchman *et al.*, teach protein which interacts with the Huntington's disease gene product, cDNA coding therefor, and antibodies thereto. The HIP1 cDNA sequence (SEQ ID NO: 5), which is 4796 nucleotide long, is translated into a polypeptide with 914 amino acids (see lines 3-8 in page 5 and SEQ ID Nos: 5 and 6 in page 25-31). Although it appeared that SEQ ID Nos: 5 and 6 had 4846 nucleotides and 924 amino acids respectively, in fact, there was mistakes in sequence numbers when Kalchman *et al.*, numbered SEQ ID Nos: 5 and 6 wherein nucleotides 3901-4796 in SEQ ID NO: 5 was numbered as nucleotide 3951-4846 and amino acids 751-914 was numbered as amino acids 761-924, the examiner has renumbered nucleotide and amino acid sequences in SEQ ID NO: 5 and SEQ ID NO: 6 respectively (see pages 25-31 in attached office action).

Regarding claims 7, 13, 20, and 22, comparison of nucleotide sequences between SEQ ID No: 5 in the reference of Kalchman *et al.*, and SEQ ID No: 3 recited in claims 7 and 20 and comparison of amino acid sequences between SEQ ID No: 6 in the reference of Kalchman *et al.*, and SEQ ID No: 4 recited in claims 13 and 22 show that SEQ ID NO: 5 in the reference of Kalchman *et al.*, is identical to SEQ ID No: 3 recited in claims 7 and 20 while SEQ ID NO: 6 in the reference of Kalchman *et al.*, is identical to SEQ ID No: 4 recited in claims 13 and 22. Since

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an isolated nucleic acid molecule recited in claim 20 is read as an isolated nucleic acid molecule consisting of SEQ ID NO: 3 and SEQ ID NO: 5 in the reference of Kalchman *et al.*, is HIP1 cDNA with 4796 nucleotides and encodes a polypeptide with 914 amino acids (SEQ ID NO:6), claim 20 is anticipated by Kalchman *et al.*. Since SEQ ID NO: 3 encodes a polypeptide consisting of SEQ ID NO: 4 (see specification, lines 3-14 in page 5), claim 22 is anticipated by Kalchman *et al.*. Since Kalchman *et al.*, states that “because more of the expanded forms of the HD protein may be available for cleavage (and subsequent apoptosis) due to the fact they are not as tightly associated at the HD-HIP1-cytoskeletal complex” (see page 7, lines 5-10), HIP1 taught by Kalchman *et al.*, is a HD-interacting polypeptide or a HIP-apoptosis modulating protein as recited in claim 7. Since DNA encoding HIP 1 taught by Kalchman *et al.*, is cloned into an expression vector (see page 7, last paragraph) and an expression vector recited in claim 7 is read as an expression vector comprising an isolated nucleic acid consisting of SEQ ID NO: 3 which encodes a polypeptide consisting of SEQ ID NO: 4, claims 7, 13, and 25 are anticipated by Kalchman *et al.*.

Regarding claims 16, 17 and 24, since Kalchman *et al.*, teach DNA encoding HIP 1 (ie., consisting of SEQ ID NO:3) in an expression vector is introduced into a mammalian cell such as brain cells (see page 7, last paragraph) and the mammalian cell is a host cell, claims 16, 17, and 24 are anticipated by Kalchman *et al.*.

Kalchman *et al.*, teach all limitations recited in claims 7, 13, 16, 17, 20, 22, 24, and 25.

Response to Arguments

In page 5, fifth paragraph bridging to page 6, first paragraph of applicant's remarks filed on January 23, 2004, applicant argues that the amendments are sufficient to avoid anticipation by WO 97/18825.

This argument has been fully considered but it is not persuasive toward the withdrawal of the rejection because SEQ ID NO: 5 in the reference of Kalchman *et al.*, is identical to SEQ ID No: 3 recited in claims 7 and 20 while SEQ ID NO: 6 in the reference of Kalchman *et al.*, is identical to SEQ ID No: 4 recited in claims 13 and 22 (for detail, see above rejection under 35 USC 102 (b)).

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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15. No claim is allowed.
16. Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CAR § 1.6(d)). The CM Fax Center number is either (703)872-9306 or (703)305-3014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Lu, Ph.D., whose telephone number is (571)272-0746. The examiner can normally be reached on Monday-Friday from 9 A.M. to 5 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached on (571)272-0782.

Any inquiry of a general nature or relating to the status of this application should be directed to the Chemical Matrix receptionist whose telephone number is (703) 308-0196.

Frank Lu
PSA
April 30, 2004


FRANK LU
PATENT EXAMINER

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Thr	Asp	Thr	Glu	Ala	Gly	Cys	Val	Pro	Leu	Leu	His	Pro	Glu	Glu	
1				5					10					15	
Ile	Lys	Pro	Gln	Ser	His	Tyr	Asn	His	Gly	Tyr	Gly	Glu	Pro	Leu	
				20					25					30	
Gly	Arg	Lys	Thr	His	Ile	Asp	Asp	Tyr	Ser	Thr	Trp	Asp	Ile	Val	
				35					40					45	
Lys	Ala	Thr	Gln	Tyr	Gly	Ile	Tyr	Glu	Arg	Cys	Arg	Glu	Leu	Val	
				50					55					60	
Glu	Ala	Gly	Tyr	Asp	Val	Arg	Gln	Pro	Asp	Lys	Glu	Asn	Val	Thr	
				65					70					75	
Leu	Leu	His	Trp	Ala	Ala	Ile	Asn	Asn	Arg	Ile	Asp	Leu	Val	Lys	
				80					85					90	
Tyr	Tyr	Ile	Ser	Lys	Gly	Ala	Ile	Val	Asp	Gln	Leu	Gly	Gly	Asp	
				95					100					105	
Leu	Asn	Ser	Thr	Pro	Leu	His	Trp	Asp	Thr	Arg	Gln	Gly	His	Leu	
				110					115					120	
Ser	Met	Val	Val	Gln	Leu	Met	Lys	Tyr	Gly	Ala	Asp	Pro	Ser	Leu	
				125					130					135	
Ile	Asp	Gly	Glu	Gly	Cys	Ser	Cys	Ile	His	Leu	Ala	Ala	Gln	Phe	
				140					145					150	
Gly	His	Thr	Ser												
				154											

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 4846

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(iii) HYPOTHETICAL: no

(iv) ANTI-SENSE: no

(vi) ORIGINAL SOURCE:

(A) ORGANISM: human

(ix) FEATURE: cDNA for Huntingtin-interacting protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

CAGTGTACGG	TTGATCATAT	AACGCCGCGG	GCGGGGATTG	GTTTATATAT	50
CGCAAATTGA	TNTAGGGGGG	GGGGGATGGN	CAGAGATTTC	GCTTCATTAG	100
GCCATTATAA	GCAGGAAGGG	TTTCAAGGAA	AAAAACCCAG	AAAGTGCATA	150
TTGCACCCAC	CATGAGAAAG	GGGCAACAGA	CCTTNTGTTN	TGTTNTCAAC	200

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CGCCTGCTTC	TGTTTTAGCA	ACGCAGTGTT	TTGGTGGAAG	TTGTGCCATG	250
TGTTCCACAA	ANTCTTCCGA	GATGGACACC	CGAACGTCCT	GAAGGACTTT	300
GTGAGATACA	GAAATGAATT	GAGTGACATG	AGCAGGATGT	GGGGCCACCT	350
GAGCGAGGGG	TATGGCCAGC	TGTGCAGCAT	CTACCTGAAA	CTGCTAAGAA	400
CCAAGATGGA	GTACCACACC	AAAAATCCCA	GGTTCCCAGG	CAACCTGCAG	450
ATGAGTGACC	GCCAGCTGGA	CGAGGCTGGA	GAAAGTGACG	TGAACAACTT	500
TTTCCAGTTA	ACAGTGGAGA	TGTTTGTACTA	CCTGGAGTGT	GAACTCAACC	550
TCTTCCAAAC	AGTATTCAAC	TCCCTGGACA	TGTCCCGCTC	TGTGTCCGTG	600
ACGGCAGCAG	GGCAGTGCCG	CCTCGCCCCG	CTGATCCAGG	TCATCTTGGA	650
CTGCAGCCAC	CTTTATGACT	ACACTGTCAA	GCTTCTCTTC	AAACTCCACT	700
CCTGCCTCCC	AGCTGACACC	CTGCAAGGCC	ACCGGGACCG	CTTCATGGAG	750
CAGTTTACAA	AGTTGAAAGA	TCTGTTCTAC	CGCTCCAGCA	ACCTGCAGTA	800
CTTCAAGCGG	CTCATTCAGA	TCCCCCAGCT	GCCTGAGAAC	CCACCCAACT	850
TCCTGCGAGC	CTCAGCCCTG	TCAGAACATA	TCAGCCCTGT	GGTGGTGATC	900
CCTGCAGAGG	CCTCATCCCC	CGACAGCGAG	CCAGTCCTAG	AGAAGCATGA	950
CCTCATGGAC	ATGGATGCCT	CTCAGCAGAA	TTTATTTGAC	AACAAGTTTG	1000
ATGACATCTT	TGGCAGTTCA	TTCAGCAGTG	ATCCCTTCAA	TTTCAACAGT	1050
CAAAATGGTG	TGAACAAGGA	TGAGAAGGAC	CACTTAATTG	AGCGACTATA	1100
CAGAGAGATC	AGTGGATTGA	AGGCACAGCT	AGAAAACATG	AAGACTGAGA	1150
GCCAGCGGGT	TGTGCTGCAG	CTGAAGGGCC	ACGTGAGCGA	GCTGGAAGCA	1200
GATCTGGCCG	AGCAGCAGCA	CCTGCGGCAG	CAGGCGGCCG	ACGACTGTGA	1250
ATTCTTGCCG	GCAGAACTGG	ACGAGCTCAG	GAGGCAGCGG	GAGGACACCG	1300
AGAAGCTCCA	GCGGAGCCTG	TCTGAGATAG	AAAGGAAAGC	TCAAGCCAAT	1350
GAACAGCGAT	ATAGCAAGCT	AAAGGAGAAG	TACAGCGAGC	TGTTTCAGAA	1400
CCACGCTGAC	CTGCTGCGGA	AGAATGCAGA	GGTGACCAAA	CAGGTGTCCA	1450
TGGCCAGACA	AGCCCAGGTA	GATTTGGAAC	GAGAGAAAAA	AGAGCTGGAG	1500
GATTCGTTGG	AGCGCATCAG	TGACCAGGGC	CAGCGGAAGA	CTCAAGAACA	1550
GCTGGAAGTT	CTAGAGAGCT	TGAAGCAGGA	ACTTGGCACA	AGCCAACGGG	1600
AGCTTCAGGT	TCTGCAAGGC	AGCCTGGAAA	CTTCTGCCCA	GTCAGAAGCA	1650
AACTGGGCAG	CCGAGTTCGC	CGAGCTAGAG	AAGGAGCGGG	ACAGCCTGGT	1700
GAGTGGCCGA	GCTCATAGGG	AGGAGGAATT	ATCTGCTCTT	CGGAAAGAAC	1750
TGCAGGACAC	CTCAGCTCAA	CTGGCCAGCA	CAGAGGAATC	TATGTGCCAG	1800
CTTGCCAAAG	ACCAACGAAA	AATGCTTCTG	GTGGGGTCCA	GGAAGGCTGC	1850
GGAGCAGGTG	ATACAAGACG	CCCTGAACCA	GCTTGAAGAA	CCTCCTCTCA	1900
TCAGCTGCGC	TGGGTCTGCA	GATCACCTCC	TCTCCACGGT	CACATCCATT	1950
TCCAGCTGCA	TCGAGCAACT	GGAGAAAAGC	TGGAGCCAGT	ATCTGGCCTG	2000
CCCAGAAGAC	ATCAGTGGAC	TTCTCCATTC	CATAACCCTG	CTGGCCCACT	2050
TGACCAGCGA	CGCCATTGCT	CATGGTGCCA	CCACCTGCCT	CAGAGCCCCA	2100
CCTGAGCCTG	CCGACTCACT	GACCGAGGCC	TGTAAGCAGT	ATGGCAGGGA	2150
AACCCCTCGC	TACCTGGCCT	CCCTGGAGGA	AGAGGGAAGC	CTTGAGAATG	2200
CCGACAGCAC	AGCCATGAGG	AACTGCCTGA	GCAAGATCAA	GGCCATCGGC	2250
GAGGAGCTCC	TGCCCAGGGG	ACTGGACATC	AAGCAGGAGG	AGCTGGGGGA	2300
CCTGGTGGAC	AAGGAGATGG	CGGCCACTTC	AGCTGCTATT	GAAACTTGCA	2350
CGGCCAGAAT	AGAGGAGATG	CTCAGCAAAT	CCCAGCAGG	AGACACAGGA	2400
GTCAAATTGG	AGGTGAATGA	AAGGATCCTT	CGTTGCTGTA	CCAGCCTCAT	2450
GCAAGCTATT	CAGGTGCTCA	TCGTGGCCTC	TAAGGACCTC	CAGAGAGAGA	2500
TTGTGGAGAG	CGGCAGGGGT	ACAGCATCCC	CTAAAGAGTT	TTATGCCAAG	2550
AACTCTCGAT	GGACAGAAGG	ACTTATCTCA	GCCTCCAAGG	CTGTGGGCTG	2600
GGGAGCCACT	GTCATGGTGG	ATGCAGCTGA	TCTGGTGGTA	CAAGGCAGAG	2650
GGAAATTTGA	GGAGCTAATG	GTGTGTTCTC	ATGAAATTGC	TGCTAGCACA	2700
GCCAGCTTTG	TGGCTGCATC	CAAGGTGAAA	GCTGATAAGG	ACAGCCCCAA	2750
CCTAGCCCAG	CTGCAGCAGG	CCTCTCGGGG	AGTGAACCAG	GCCACTGCCG	2800
GCGTTGTGGC	CTCAACCAAT	TCCGGCAAAT	CACAGATCGA	AGAGACAGAC	2850
AACATGGACT	TCTCAAGCAT	GACGCTGACA	CAGATCAAAC	GCCAAGAGAT	2900

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GGATTCTCAG	GTTAGGGTGC	TAGAGCTAGA	AAATGAATTG	CAGAAGGAGC	2950
GTCAAAAAC	GGGAGAGCTT	CGGAAAAAGC	ACTACGAGCT	TGCTGGTGT	3000
GCTGAGGGCT	GGGAAGAAGG	AACAGAGGCA	TCTCCACCTA	CACTGCAAGA	3050
AGTGGTAACC	GAAAAAGAAT	AGAGCCAAAC	CAACACCCCA	TATGTCAGTG	3100
TAAATCCTTG	TTACCTATCT	CGTGTGTGTT	ATTTCCCCAG	CCACAGGCCA	3150
AATCCTTGGA	GTCCCAGGGG	CAGCCACACC	ACTGCCATTA	CCCAGTGCCG	3200
AGGACATGCA	TGACACTTCC	CAAAGATCCC	TCCATAGCGA	CACCCCTTCT	3250
GTTTGGACCC	ATGGTCATCT	CTGTTCTTTT	CCCGCTCCC	TAGTTAGCAT	3300
CCAGGCTGGC	CAGTGCTGCC	CATGAGCAAG	CCTAGGTACG	AAGAGGGGTG	3350
GTGGGGGGCA	GGGCCACTCA	ACAGAGAGGA	CCAACATCCA	GTCTGCTGA	3400
CTATTTGACC	CCCACAACAA	TGGGTATCCT	TAATAGAGGA	GCTGCTTGTT	3450
GTTTGTGAC	AGCTTGGA	GGGAAGATCT	TATGCCTTTT	CTTTCTGTT	3500
TTCTTCTCAG	TCTTTTCAGT	TTTCATCA	GCACAACTT	GTGAGCATCA	3550
GAGGGCTGAT	GGATTCCAAA	CCAGGACACT	ACCCTGAGAT	CTGCACAGTC	3600
AGAAGGACGG	CAGGAGTGTC	CTGGCTGTGA	ATGCCAAAGC	CATTCTCCCC	3650
CTCTTTGGGC	AGTGCCATGG	ATTTCCACTG	CTTCTTATGG	TGGTTGGTTG	3700
GGTTTTTTTG	TTTTGTTTTT	TTTTTTTAAG	TTTCACTCAC	ATAGCCAACT	3750
CTCCCAAAGG	GCACACCCCT	GGGGCTGAGT	CTCCAGGGCC	CCCCAACTGT	3800
GGTAGCTCCA	GCGATGGTGC	TGCCCAGGCC	TCTCGGTGCT	CCATCTCCGC	3850
CTCCACACTG	ACCAAGTGCT	GGCCCACCCA	GTCCATGCTC	CAGGGTCAGG	3900
CGGAGCTGCT	GAGTGACAGC	TTTCCTCAAA	AAGCAGAAGG	AGAGTGAGTG	4000 3950
CCTTTCCCTC	CTAAAGCTGA	ATCCCGGCGG	AAAGCCTCTG	TCCGCCTTTA	4050 4000
CAAGGGAGAA	GACAACAGAA	AGAGGGACAA	GAGGGTTTAC	ACAGCCAGT	4100 4050
TCCCGTGACG	AGGCTCAAAA	ACTTGATCAC	ATGCTTGAAT	GGAGCTGGTG	4150 4100
AGATCAACAA	CACTACTTCC	CTGCCGGAAT	GAAGTGTCCG	TGAATGGTCT	4200 4150
CTGTCAAGCG	GGCCGTCTCC	CTTGGCCAG	AGACGGAGTG	TGGGAGTGAT	4250 4200
TCCCAACTCC	TTTCTGCAGA	CGTCTGCCTT	GGCATCCTCT	TGAATAGGAA	4300 4250
GATCGTTCCA	CTTTCTACGC	AATTGACAAA	CCCGGAAGAT	CAGATGCAAT	4350 4300
TGCTCCCATC	AGGGAAGAAC	CCTATACTTG	GTTTGCTACC	CTTAGTATTT	4400 4350
ATTACTAACC	TCCCTTAAGC	AGCAACAGCC	TACAAAGAGA	TGCTTGAGC	4450 4400
AATCAGAACT	TCAGGTGTGA	CTCTAGCAAA	GCTCATCTTT	CTGCCCGGCT	4500 4450
ACATCAGCCT	TCAAGAATCA	GAAGAAAGCC	AAGGTGCTGG	ACTGTTACTG	4550 4500
ACTTGGATCC	CAAAGCAAGG	AGATCATTTG	GAGCTCTTGG	GTCAGAGAAA	4600 4550
ATGAGAAAGG	ACAGAGCCAG	CGGCTCCAAC	TCCTTTTACG	CACATGCCCC	4650 4600
AGGCTCTCGC	TGCCCTGTGG	ACAGGATGAG	GACAGAGGGC	ACATGAACAG	4700 4650
CTTGCCAGGG	ATGGGCAGCC	CAACAGCACT	TTTCCTCTTC	TAGATGGACC	4750 4700
CCAGCATTTA	AGTGACCTTC	TGATCTTGGG	AAAACAGCGT	CTTCCTTCTT	4800 4750
TATCTATAGC	AACTCATTTG	TGGTAGCCAT	CAAGCACTTC	GGAATT	4846 4796

(2) INFORMATION FOR SEQ ID NO:6

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 924

(B) TYPE: protein

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(iii) HYPOTHETICAL: no

(vi) ORIGINAL SOURCE:

(A) ORGANISM: human

(ix) FEATURE: Huntingtin-interacting protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

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Met	Ser	Arg	Met	Trp	Gly	His	Leu	Ser	Glu	Gly	Tyr	Gly	Gln	Leu	1	5	10	15
Cys	Ser	Ile	Tyr	Leu	Lys	Leu	Leu	Arg	Thr	Lys	Met	Glu	Tyr	His	20	25	30	
Thr	Lys	Asn	Pro	Arg	Phe	Pro	Gly	Asn	Leu	Gln	Met	Ser	Asp	Arg	35	40	45	
Gln	Leu	Asp	Glu	Ala	Gly	Glu	Ser	Asp	Val	Asn	Asn	Phe	Phe	Gln	50	55	60	
Leu	Thr	Val	Glu	Met	Phe	Asp	Tyr	Leu	Glu	Cys	Glu	Leu	Asn	Leu	65	70	75	
Phe	Gln	Thr	Val	Phe	Asn	Ser	Leu	Asp	Met	Ser	Arg	Ser	Val	Ser	80	85	90	
Val	Thr	Ala	Ala	Gly	Gln	Cys	Arg	Leu	Ala	Pro	Leu	Ile	Gln	Val	95	100	105	
Ile	Leu	Asp	Cys	Ser	His	Leu	Tyr	Asp	Tyr	Thr	Val	Lys	Leu	Leu	110	115	120	
Phe	Lys	Leu	His	Ser	Cys	Leu	Pro	Ala	Asp	Thr	Leu	Gln	Gly	His	125	130	135	
Arg	Asp	Arg	Phe	Met	Glu	Gln	Phe	Thr	Lys	Leu	Lys	Asp	Leu	Phe	140	145	150	
Tyr	Arg	Ser	Ser	Asn	Leu	Gln	Tyr	Phe	Lys	Arg	Leu	Ile	Gln	Ile	155	160	165	
Pro	Gln	Leu	Pro	Glu	Asn	Pro	Pro	Asn	Phe	Leu	Arg	Ala	Ser	Ala	170	175	180	
Leu	Ser	Glu	His	Ile	Ser	Pro	Val	Val	Val	Ile	Pro	Ala	Glu	Ala	185	190	195	
Ser	Ser	Pro	Asp	Ser	Glu	Pro	Val	Leu	Glu	Lys	Asp	Asp	Leu	Met	200	205	210	
Asp	Met	Asp	Ala	Ser	Gln	Gln	Asn	Leu	Phe	Asp	Asn	Lys	Phe	Asp	215	220	225	
Asp	Ile	Phe	Gly	Ser	Ser	Phe	Ser	Ser	Asp	Pro	Phe	Asn	Phe	Asn	230	235	240	
Ser	Gln	Asn	Gly	Val	Asn	Lys	Asp	Glu	Lys	Asp	His	Leu	Ile	Glu	245	250	255	
Arg	Leu	Tyr	Arg	Glu	Ile	Ser	Gly	Leu	Lys	Ala	Gln	Leu	Glu	Asn	260	265	270	

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Met	Lys	Thr	Glu	Ser	Gln	Arg	Val	Val	Leu	Gln	Leu	Lys	Gly	His	275	280	285
Val	Ser	Glu	Leu	Glu	Ala	Asp	Leu	Ala	Glu	Gln	Gln	His	Leu	Arg	290	295	300
Gln	Gln	Ala	Ala	Asp	Asp	Cys	Glu	Phe	Leu	Arg	Ala	Glu	Leu	Asp	305	310	315
Glu	Leu	Arg	Arg	Gln	Arg	Glu	Asp	Thr	Glu	Lys	Ala	Gln	Arg	Ser	320	325	330
Leu	Ser	Glu	Ile	Glu	Arg	Lys	Ala	Gln	Ala	Asn	Glu	Gln	Arg	Tyr	335	340	345
Ser	Lys	Leu	Lys	Glu	Lys	Tyr	Ser	Glu	Leu	Val	Gln	Asn	His	Ala	350	355	360
Asp	Leu	Leu	Arg	Lys	Asn	Ala	Glu	Val	Thr	Lys	Gln	Val	Ser	Met	365	370	375
Ala	Arg	Gln	Ala	Gln	Val	Asp	Leu	Glu	Arg	Glu	Lys	Lys	Glu	Leu	380	385	390
Glu	Asp	Ser	Leu	Glu	Arg	Ile	Ser	Asp	Gln	Gly	Gln	Arg	Lys	Thr	395	400	405
Gln	Glu	Gln	Leu	Glu	Val	Leu	Glu	Ser	Leu	Lys	Gln	Glu	Leu	Gly	410	415	420
Thr	Ser	Gln	Arg	Glu	Leu	Gln	Val	Leu	Gln	Gly	Ser	Leu	Glu	Thr	425	430	435
Ser	Ala	Gln	Ser	Glu	Ala	Asn	Trp	Ala	Ala	Glu	Phe	Ala	Glu	Leu	440	445	450
Glu	Lys	Glu	Arg	Asp	Ser	Leu	Val	Ser	Gly	Ala	Ala	His	Arg	Glu	455	460	465
Glu	Glu	Leu	Ser	Ala	Leu	Arg	Lys	Glu	Leu	Gln	Asp	Thr	Gln	Leu	470	475	480
Lys	Leu	Ala	Ser	Thr	Glu	Glu	Ser	Met	Cys	Gln	Leu	Ala	Lys	Asp	485	490	495
Gln	Arg	Lys	Met	Leu	Leu	Val	Gly	Ser	Arg	Lys	Ala	Ala	Glu	Gln	500	505	510
Val	Ile	Gln	Asp	Ala	Leu	Asn	Gln	Leu	Glu	Glu	Pro	Pro	Leu	Ile	515	520	525
Ser	Cys	Ala	Gly	Ser	Ala	Asp	His	Leu	Leu	Ser	Thr	Val	Thr	Ser	530	535	540

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Ile Ser Ser Cys	Ile Glu Gln Leu Glu	Lys Ser Trp Ser Gln Tyr
545	550	555
Leu Ala Cys Pro	Glu Asp Ile Ser Gly	Leu Leu His Ser Ile Thr
560	565	570
Leu Leu Ala His	Leu Thr Ser Asp Ala	Ile Ala His Gly Ala Thr
575	580	585
Thr Cys Leu Arg	Ala Pro Pro Glu Pro	Ala Asp Ser Leu Thr Glu
590	595	600
Ala Cys Lys Gln	Tyr Gly Arg Glu Thr	Leu Ala Tyr Leu Ala Ser
605	610	615
Leu Glu Glu Glu	Gly Ser Leu Glu Asn	Ala Asp Ser Thr Ala Met
620	625	630
Arg Asn Cys Leu	Ser Lys Ile Lys Ala	Ile Gly Glu Glu Leu Leu
635	640	645
Pro Arg Gly Leu	Asp Ile Lys Gln Glu	Glu Leu Gly Asp Leu Val
650	655	660
Asp Lys Glu Met	Ala Ala Thr Ser Ala	Ala Ile Glu Thr Cys Thr
665	670	675
Ala Arg Ile Glu	Glu Met Leu Ser Lys	Ser Arg Ala Gly Asp Thr
680	685	690
Gly Val Lys Leu	Glu Val Asn Glu Arg	Ile Leu Arg Cys Cys Thr
695	700	705
Ser Leu Met Gln	Ala Ile Gln Val Leu	Ile Val Ala Ser Lys Asp
710	715	720
Leu Gln Arg Glu	Ile Val Glu Ser Gly	Arg Gly Thr Ala Ser Pro
725	730	735
Lys Glu Phe Tyr	Ala Lys Asn Ser Arg	Trp Thr Glu Gly Leu Ile
740	745	750
Ser Ala Ser Lys	Ala Val Gly Trp Gly	Ala Thr Val Met Val Asp
765	770	775
755	760	765
Ala Ala Asp Leu	Val Val Gln Gly Arg	Gly Lys Phe Glu Glu Leu
780	785	790
770	775	780
Met Val Cys Ser	His Glu Ile Ala Ala	Ser Thr Ala Gln Leu Val
795	800	805
785	790	795
Ala Ala Ser Lys	Val Lys Ala Asp Lys	Asp Ser Pro Asn Leu Ala
810	815	820
800	805	810

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Gln	Leu	Gln	Gln	Ala	Ser	Arg	Gly	Val	Asn	Gln	Ala	Thr	Ala	Gly
				825					830					835
				815					820					825
Val	Val	Ala	Ser	Thr	Ile	Ser	Gly	Lys	Ser	Gln	Ile	Glu	Glu	Thr
				840					845					850
				830					835					840
Asp	Asn	Met	Asp	Phe	Ser	Ser	Met	Thr	Leu	Thr	Gln	Ile	Lys	Arg
				855					860					865
				845					850					855
Gln	Glu	Met	Asp	Ser	Gln	Val	Arg	Val	Leu	Glu	Leu	Glu	Asn	Glu
				870					875					880
				860					865					870
Leu	Gln	Lys	Glu	Arg	Gln	Lys	Leu	Gly	Glu	Leu	Arg	Lys	Lys	His
				885					890					895
				875					880					885
Tyr	Glu	Leu	Ala	Gly	Val	Ala	Glu	Gly	Trp	Glu	Glu	Gly	Thr	Glu
				900					905					910
				890					895					900
Ala	Ser	Pro	Pro	Thr	Leu	Gln	Glu	Val	Val	Thr	Glu	Lys	Glu	
				915					920				925	
				905					910				914	